

# Physiological Arousal and Reactions to Outgroup Members During Competitions That Implicate an Important Social Identity

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Exposure to sports competitions, especially those involving violence, can elevate physiological arousal, potentially setting the stage for transforming hostile inclinations into aggressive behavior. Personality and cognitive factors that influence the interpretation given to such competitions may influence the impact of these events. The effects of exposure to a sporting competition that had high or low importance for subjects' social identity on pre- to post-film blood pressure and evaluations of outgroups were examined. Aggression may be particularly likely when arousal levels are elevated, and such arousal was expected to be determined by the importance of the identity at stake, regardless of the outcome of the competition. Individuals who were either strongly identified with America or were less identified viewed a boxing match where the American athlete lost the competition (and the Russian contestant won), or the Russian athlete lost (and the American won). Both diastolic and systolic blood pressure measures showed an increase pre- to post-film in the highly identified persons while no such change was observed in the low identified individuals. Cognitive measures assessing evaluations of the Russian boxer, and Russians in general, showed effects parallel to the arousal indexes with high identified persons expressing more derogation of threat-relevant targets than did those low in identification. Arousal increases in only the highly identified viewers predicted derogation of Russians. Discussion centers on the role of identification with a sports team on physiological processes and their implications for spectator aggression.

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## INTRODUCTION

While an elevated level of physiological arousal is by no means necessary for the experience of hostility or other emotional states conducive to aggression [Berkowitz, 1978; Branscombe, 1988; Reisenzein, 1983], numerous studies have demonstrated that the presence of arousal can intensify or increase the likelihood that such predispositions will be expressed [Zillmann, 1983]. Exposure to violent and competitive sports materials may increase the likelihood of subsequent aggressive behavior either because they increase arousal and that "energizes" ongoing aggressive tendencies [Berkowitz, 1965; Geen and O'Neal, 1969; Tannenbaum and Zillmann, 1975], or because such events lead to a frustration-generated negative affective state which triggers aggression [Berkowitz, 1989]. Events that are both unpleasant and highly arousing may be particularly likely to evoke aggressive responses [Berkowitz, 1978]. This combination, which we examine here, should be especially likely to occur in persons who are highly identified with one of the participants in a violent sporting event.

All individuals do not respond in the same fashion following exposure to violence and competition. Bushman and Geen [1990] have found that personality differences in emotional susceptibility influence systolic blood pressure during exposure to violent films. Highly emotional subjects showed increased arousal, whereas those individuals lower on emotionality did not. Prior research also indicates that emotional identification with the person(s) involved in a competition may be the most important mediator of both arousal responses and subsequent aggressive behavior. Turner and Berkowitz [1972] manipulated degree of identification with one of the participants in a boxing contest. Those subjects who were asked to imagine themselves as one of the boxers subsequently delivered more and longer shocks to a confederate who had annoyed them than did the individuals who were asked to imagine themselves the judge of the fight or who were given no instructions at all. Tannenbaum and Gaer [1965] found that persons highly identified with a film character showed greater mood changes during arousal induction than did those low in identification. The nature of the outcome of the event depicted, however, determined post-film resolution or the self-reported course of arousal decay.

Social identity concerns via the psychological connection between the observers' group and the participant in a sporting contest who represents that group may be an as yet unexamined determinant of both arousal and aggressive behavior. This influence could arise for at least two reasons. For one, degree of identification with the group an athlete represents was expected to be related to the observers' imaginative participation in the event. That is, those viewers who are highly identified with the group the fighter represents may be more likely to imagine themselves hitting the opposition and vicariously experiencing the negative affect felt by the fighter. Second, because of the observers' identification with the group represented by a contestant, any defeat suffered by that athlete should be a blow to self-esteem, and this could activate aggressive inclinations. A number of investigators have suggested that aggression should be particularly likely when an event threatens one's self-esteem [Crocker et al., 1987; Kelley and Schmidt, 1989]. However, even the possibility of a defeat in the contest may disturb those who are identified with the participant's group. Knowing that the value of one's identity is at stake should make the contest a more arousing and unpleasant experience, elevating the likelihood that the high identified viewers who show the largest increases in arousal

will engage in derogation of the threat-relevant group most, regardless of the actual outcome of the contest. Degree to which arousal increases during the competition and level of identification with the American athlete are not expected to predict derogation of other threat-irrelevant groups.

## MATERIALS AND METHODS

### Subject Selection and Design

First year undergraduate females (age  $M = 18.5$  years) at a large midwestern university ( $n = 41$ ) participated in this study in exchange for partial fulfillment of their introductory psychology course requirement. Approximately 6 weeks before the experiment was conducted, during a mass testing session where a large number of unrelated questionnaires were administered, subjects indicated their degree of interest in boxing, whether they had seen the movie *Rocky IV*, and how frequently they experienced pride in their social identity as an American.<sup>1</sup> The individuals who were selected for participation had little interest in boxing per se, ensuring that the sport itself was not the object of identification. None of the subjects had been previously exposed to the commercial film from which our stimulus tapes were derived. Based on a single 1 to 8 rating assessing identification with America, two groups of individuals were selected: those who report frequently feeling proud to be American ( $n = 22$ ) and those who report a low frequency of experiencing pride in their American identity ( $n = 19$ ). Mean identification with America was significantly less in the low identification group ( $M = 3.11$ ) than in the high pride group ( $M = 7.05$ ),  $F(1,39) = 177.67$ ;  $P < .001$ . Half of each identification group were randomly assigned to view a 6-minute film clip involving a boxing match where the American fighter defeated the Soviet (the win condition), or the same match except that during the final minute the Soviet fighter defeated the American (the lose condition). The actual film content and amount of violence observed was therefore equivalent in both the win and lose conditions. Two between-subjects variables, level of identification with America and competition outcome, were employed in this experiment.

### Procedure

Prior to viewing the *Rocky* experimental film clip, the participants who were tested individually were told that the purpose of the study was to assess people's reactions to a variety of films and that they would be randomly assigned to view two of them while their blood pressure was periodically monitored. A blood pressure cuff, attached to and Omron digital blood pressure sphygmomanometer, was placed on the subject's arm

<sup>1</sup>While 178 males and 244 females were screened during the mass testing session, there were no male subjects who had not seen *Rocky IV*. Because our study involved manipulating the components of this film, it was critical that the participants remain unaware of its "true" contents, particularly the ending of the film. It was for this reason that only female subjects were employed in this research. However, males ( $M = 5.7$ ) and females ( $M = 5.5$ ) in this sample did not differ on the critical selection variable—identification with America,  $F(1,421) = .80$ ;  $P < .37$ . Furthermore, despite lessening tensions between the United States and the Soviet Union, recent research with American college students indicates that men and women do not differ in their perceptions of the Soviet Union and that 87% spontaneously mention the Soviet Union when asked about enemies of the United States [Holt, 1989].

and an initial measurement was taken. All of the participants received background information about the film they would be viewing and they were then exposed to the first film clip concerning the construction of modern zoos. This was done as a means of acquainting them with the equipment and procedure. When this neutral 4-minute film clip was completed, blood pressure was again measured and subjects were given a film evaluation questionnaire that was similar to the one they would complete following the experimental stimulus film.

At this point, written information about the experimental film was presented. Subjects read that they would be viewing a shortened version of a boxing match between two individuals. One of the participants, Rocky Balboa, was said to be an American boxer and the other, Ivan Drago, a Russian contender. The fight was ostensibly for the world heavyweight championship. It was added that many members of the audience in the film believe the honor and prestige of each country is on the line during this fight. This statement was both an accurate reflection of the spectators glimpsed during the film, as well as an encouragement for the subjects in this study to perceive the film as relevant to their national identities. The experimenter was separated from the subjects by a partition during exposure to the films and again while they completed the evaluation questionnaires.

The true pre-film diastolic and systolic blood pressure reading was collected once the background information had been read, and the subject was exposed to one of the two experimental film clips. Post-film blood pressure readings were taken immediately after the competition terminated. Subjects were then given a questionnaire concerning the fight itself, its participants, the outcome, Russians in general, and other outgroups. Specifically, on a 1 to 8 scale (with endpoints "not at all" and "very much"), respondents rated how much they enjoyed the video, how much they liked the two athletes, and external attributions concerning the extent to which the match outcome was due to factors other than the skill of each boxer (e.g., the referee was biased; the fight took place in Moscow).

Two types of items were used to assess subjects' willingness to derogate or distance themselves from outgroups. The first set assessed reactions to Russians specifically. Subjects indicated on a 1 to 8 scale degree of agreement (from "not at all" to "very much") with statements concerning their willingness to help a Russian foreign exchange student get adjusted to America, the favorability of a policy where the U.S. and the Soviet Union participate in a joint space program, the belief that Russians in general are trustworthy, and the assignment of blame to Russia for the nuclear arms buildup. The second category of items afforded the participants an opportunity to express negative sentiments toward other threat-irrelevant outgroups. These items assessed degree of agreement or disagreement on the same 1 to 8 scale with government funds being used to assist South African foreign exchange students coming to America, willingness to help a French foreign exchange student become adjusted to the U.S., and willingness to assist a Chinese foreign exchange student adjusting to life in America.

## RESULTS

A manipulation check item assessing who won the fight that was viewed was completed correctly by all subjects. Those watching the win version reported that Rocky Balboa, the American fighter, won and those watching the lose version reported that Ivan Drago, the Russian contestant, won.

**TABLE I. Mean Diastolic and Systolic Blood Pressure by Time of Measurement and Level of Identification With the Group Involved in the Competition\***

Measure time	Level of identification with America	
	High	Low
Diastolic index		
Pre-film	66.27 <sub>a</sub>	64.90 <sub>a</sub>
Post-film	72.27 <sub>b</sub>	66.74 <sub>a</sub>
Systolic index		
Pre-film	107.82 <sub>a</sub>	106.05 <sub>a</sub>
Post-film	113.09 <sub>b</sub>	107.68 <sub>a</sub>

\*Means reflect millimeters of mercury. Within each index, those means with common subscripts do not significantly differ from one another.

### Physiological Measures

A 2 (level of identification)  $\times$  2 (competition outcome)  $\times$  2 (pre- to post-film blood pressure) mixed multivariate analysis of variance was performed on the diastolic and systolic arousal indexes. A significant level of identification by time interaction was observed, multivariate  $F(1,37) = 12.95$ ;  $P < .001$ . This interaction was present for the diastolic measure,  $F(1,39) = 8.95$ ;  $P < .01$ , as well as the systolic measure,  $F(1,39) = 5.01$ ;  $P < .05$ . As can be seen from the means in Table I, the two identification groups did not differ in terms of initial blood pressure on either measure. Those individuals with a strong attachment to their identity as Americans showed an increase in diastolic blood pressure during exposure to the film,  $F(1,39) = 7.75$ ;  $P < .01$ , and on the systolic pressure measure as well,  $F(1,39) = 4.71$ ;  $P < .05$ . No significant change pre- to post-film was observed for those low in identification on either blood pressure index.

### Video, Participants, and Outcome Evaluations

Ratings concerning enjoyment of the video were subjected to a 2 (level of identification)  $\times$  2 (outcome condition) analysis of variance. A strong main effect of outcome was observed,  $F(1,37) = 18.56$ ;  $P < .001$ , where more enjoyment was experienced when the American boxer won ( $M = 5.29$ ) relative to when he lost ( $M = 3.86$ ). When the identification groups were examined separately, greater enjoyment was reported in the win condition than in the lose condition among the highly identified persons ( $M = 5.36$  versus 3.50),  $F(1,21) = 17.73$ ;  $P < .001$ , but no differences were observed for those low in identification ( $M = 5.20$  versus 4.31). This suggests the highly identified subjects seeing their favorite lose experienced the greatest negative affect.

To examine perceptions of the competition participants, a 2 (level of identification)  $\times$  2 (outcome condition)  $\times$  2 (target—American vs. Russian athlete) mixed multivariate analysis of variance was performed on the liking items. A significant target by level of identification interaction was obtained,  $F(1,37) = 4.37$ ;  $P < .04$ . The high and low identified persons did not differ in their evaluations of Rocky, the American target, who was perceived overall as fairly likable ( $M = 5.56$ ). Ivan, the Russian target, was not liked. He was perceived significantly more negatively by those high in identification ( $M = 1.95$ ) compared with those low in identification ( $M = 2.85$ ),  $F(1,37) = 7.17$ ;  $P < .02$ . Outcome did not influence liking of either target.

The tendency to attribute the competition outcome to factors other than the skill of

each contender, including referee bias and the Moscow competition location, was assessed by combining these two external attributional items. Cronbach's standardized alpha coefficient was .53 for ratings of the extent to which the outcome was due to these external and potentially biasing factors. A 2 (level of identification)  $\times$  2 (match outcome) analysis of variance revealed only a main effect of outcome,  $F(1,37) = 8.39$ ;  $P < .01$ . The outcome was more likely to be attributed to external factors when the American lost ( $M = 3.65$ ) than when he won ( $M = 2.33$ ).

### **Derogation of Threat-Specific and Irrelevant Outgroups**

The items tapping negative evaluations of Russians in general, their lack of trustworthiness and blame for the arms race, and lack of willingness to assist Russians as individuals or as part of a joint space venture were combined to form an index (Cronbach's standardized alpha = .73). A 2 (level of identification)  $\times$  2 (match outcome) analysis of variance on this derogation measure resulted in a marginally significant two-way interaction,  $F(1,37) = 3.04$ ;  $P < .09$ . While the mean endorsement of these negative items was identical for the two identification groups when the American boxer won ( $M = 3.90$ ), under losing conditions the high identification subjects were significantly more negative about Russians ( $M = 4.20$ ) than were the low identification individuals ( $M = 3.03$ ),  $F(1,18) = 6.66$ ;  $P < .02$ .

The three items assessing negative responses to threat-irrelevant outgroups (a lack of willingness to help South Africans, French, and Chinese students) were combined to form an index (reliability coefficient = .77). A 2 (level of identification)  $\times$  2 (match outcome) analysis of variance produced only a significant main effect of outcome,  $F(1,37) = 5.01$ ;  $P < .03$ . Subjects exposed to the American boxer winning were more unwilling to offer assistance to these other outgroups ( $M = 2.83$ ) than were those who had witnessed the American losing ( $M = 1.92$ ). Thus, the influence of the independent variables on responses to the threat-irrelevant outgroups was very different than that observed for the threat-relevant targets.

In order to test the hypothesis that identification with the group a contestant represents and the degree to which arousal is increased while viewing the fight predict threat-relevant derogation, but not threat-irrelevant derogation, two regression analyses were performed. Level of identification, the difference between pre- and post-film systolic blood pressure, and the interaction between identification and arousal change were regressed on the measure of threat-relevant derogation and then on the measure of responses to the threat-irrelevant groups.<sup>2</sup> For the measure involving Russian derogation, the overall equation was significant,  $F(3,37) = 4.45$ ;  $P < .009$ . Only the coefficient for the interaction (.75) was significant, however,  $F(1,37) = 4.64$ ;  $P < .04$ . For the low identification group, the slope of the regression line was horizontal. Hence, arousal changes in this group (change scores ranged from  $-6$  to  $+14$ , where positive numbers indicate increases in arousal) did not predict derogation of Russians. For the high identification group, on the other hand, as arousal increased (change scores ranged from  $+2$  to  $+12$ ), so too did derogation of Russians. The reduced ability to predict

<sup>2</sup>The regression analyses reported here collapse across the outcome variable. First, our original hypothesis concerned the combined effects of arousal and identification, regardless of the final outcome. Second, the three-way interaction between arousal change, outcome, and level of identification was not significant in any of the analyses reported here.

Russian derogation among the respondents low in identification, based on changes in arousal, therefore cannot be attributed to a restriction of range on this measure.

While the overall regression equation predicting responses to the threat-irrelevant groups was also significant,  $F(3,37) = 7.08$ ;  $P < .001$ , the interaction between identification and arousal change was not. The coefficient reflecting the main effect for arousal change (.84) was the only significant effect,  $F(1,37) = 10.78$ ;  $P < .002$ . Hence, as arousal increased distancing from other outgroups did as well, but this effect was not dependent upon the perceiver's identification with the group the fighter represented.

It was expected that the systolic blood pressure measure, because it has been consistently associated with sympathetic activation in past research [Kim and Baron, 1988; Zillmann et al., 1972], would be a better predictor of derogation than would the diastolic index. The regression equations predicting responses to Russian targets or other outgroups were not significant when the diastolic measure was substituted for the systolic index.

## DISCUSSION

Identification with a group that a sports figure represents influences physiological processes during exposure to a competition involving that group. Only those individuals for whom the group possessed strong identity implications demonstrated significant arousal increases during the film. Arousal increases for the highly identified individuals predicted the amount of derogation that they expressed towards the threat-relevant outgroup. This was not the case for threat-irrelevant outgroups. Differential ability to predict responses to threat-relevant and threat-irrelevant outgroups is not simply a measurement artifact. The reliability coefficients for both of the derogation indexes are similar, with the threat-irrelevant measure possessing slightly more consistency (.77) than the threat-relevant items (.73).

Arousal during the film itself was unrelated to the eventual outcome of the match. In this study the post-film blood pressure measure was taken immediately after the film terminated. It is not known, however, whether arousal dissipation is affected by outcome as well as identification. Those who are highly identified with a defeated group may maintain their level of arousal for a longer period of time, whereas those allegiant fans who view a successful match may more readily return to a normal physiological state. Further research is needed to test this possibility using physiological indexes. Tannenbaum and Gaer [1965] obtained self-report data that supports such a process.

With elevated levels of arousal among the highly identified spectators, and evident hostility toward the Russian boxer as well as Russians in general, the stage may be set for subsequent aggressive behavior. There is substantial evidence linking physiological arousal and frustration-generated negative affect with aggression [Berkowitz, 1989; Zillmann, 1983]. While residual arousal may be transferred across situations and targets, our data suggest that at least immediately after the event, aggression is not likely to be directed towards all targets. Highly identified persons were indeed more likely to derogate the outgroup contestant and Russians more generally, the threat-specific targets. They were not, however, more likely to derogate other outgroups. Hence, highly identified individuals were not just simply more negative overall, due to the presence of elevated levels of arousal. Nor were they simply responding to the outcome, or even affective involvement with the sport itself. Rather, they responded to the threat-specific

targets with greater negativity only. Thus, arousal seems to selectively influence cognitive processes.

Enjoyment of the competition and attributions for its outcome reflected, for the most part, only the success of the athlete who represented the identity group, although the high identification group did report less enjoyment under losing conditions compared to when the American boxer won. This is consistent with research on sports spectators where fans report attending competitions with the anticipation that such events will be exciting, raise their arousal levels, provide an interesting diversion regardless of the teams involved, and allow them an opportunity to be part of an important social event [Koppett, 1981; Smith et al., 1981]. Sports spectatorship can seemingly provide some affective rewards regardless of outcome and amount of aggression displayed by the players [Russell, 1986]. Level of identification does not seem to strongly alter attributions per se, group membership seems to be the critical factor in the generation of self-serving explanations for the outcome [Hastorf and Cantril, 1954]. Presumably all of the participants in the current study were defining themselves and responding as "Americans" when explaining the outcome of the fight.

In summary, we have shown that exposure to violent sporting events does not influence all spectators similarly. Degree of identification, or the meaning the competition has for the individual, is an important mediator of the effects of exposure. When the competition represents a threat to an important social identity then exposure elevates arousal levels and increases threat-relevant outgroup derogation. The pairing of arousal and negative social evaluations of targets who represent a threat to an important social identity of the perceiver, elevates the likelihood that aggression will be expressed towards any member of the threat-relevant group, even those completely unconnected with the witnessed competition itself (e.g., Russians in general). Spectator violence may be increasing [Atyeo, 1979], partly because the average fan is more committed and has stronger identity ties to the team than has been true in the past. During this century traditional social ties and sources of social identity have declined, with sports team identification increasingly replacing those attachments [Guttmann, 1978]. While sports team identification clearly has some positive social and self-concept consequences [Branscombe and Wann, *in press*], the darker side involves the potential for aggression towards competing outgroup members.

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